

NASA impact on Numerical Weather Prediction: Past, Present and Future

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I will review one of the first FGGE data impacts, when for the first time it was shown that TOVS data had a huge positive impact in the SH (but unfortunately the impact was neutral or negative in the NH). The reason was the use of retrievals that included climatological information (not the “flow of the day”). NCEP in 1992 tested for the first time the direct use of clear radiances that don’t need such information, and this resulted in significant positive impacts in the NH as well as the SH. The advent of AMSU had another major positive impact in all operational centers, so much so that a space based observing system gives better forecasts than a conventional in situ observing system, even in the NH. The question of retrievals versus radiances and their impact on NWP has been revisited with the incredible success of the very high resolution AIRS where accurate, partially clouded retrievals can be obtained without resorting to the use of climatological data. In the discussion of the future I will suggest improvement of NWP will continue with the use of advanced methods for data assimilation including “errors of the day”, such as Ensemble Kalman Filter and 4D-Var, which are giving competitive results, together with lidar wind profile measurements, the only major gap remaining in the global observing system.